

WHAT IS CLAIMED IS:

1. A scanning lens for an optical scanner, comprising a curved surface and having a specific adjusting axis, wherein
 - the specific adjusting axis is a rotating center of the scanning lens and center of the curved surface,
 - the scanning lens is disposed on a holding member in such a manner that the curved surface is in contact with a receiving surface of the holding member, and
 - a position of the scanning lens is adjusted by a rotating mechanism that rotates the scanning lens.
2. The scanning lens according to claim 1, wherein the scanning lens has a power in a sub-scanning direction, taking the specific adjusting axis as an optical axis.
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 3. An optical scanner comprising:
 - a scanning lens having a curved surface centering around an optical axis;
 - a scanning lens holding member that holds the scanning lens,
 - 20 having a receiving surface that supports the curved surface; and
 - an adjustment member that rotates the scanning lens, with the optical axis as a rotating center, to adjust a position of the scanning lens.

4. The optical scanner according to claim 3, wherein the adjustment member is disposed at a symmetrical position across the receiving surface.

- 5 5. An optical scanner comprising:
- a scanning lens that is disposed in a main scanning direction as a longitudinal direction, and that transmits light from a light source;
- a scanning lens holding member that holds the scanning lens so that the scanning lens is movable in a sub-scanning direction; and
- 10 an adjustment unit including
- two eccentric members that are disposed on both ends of the scanning lens, and rotate centering around each of supporting axes that are perpendicular to both the main scanning direction and the sub-scanning direction, respectively; and
- 15 an eccentric amount adjustment unit that respectively adjusts eccentric amounts of the eccentric members, wherein
- outer surfaces of each of the eccentric members make a contact with the both ends of the scanning lens, respectively, and
- both ends of the scanning lens are displaced in a sub-scanning
- 20 direction based on the eccentric amounts that change with a rotation of the eccentric members.

6. An optical scanner comprising:
- a scanning lens that is disposed in a main scanning direction as a longitudinal direction, and that transmits light from a light source;
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a scanning lens holding member that holds the scanning lens so that the scanning lens is movable in a sub-scanning direction; and
an adjustment unit that is disposed on each of longitudinal ends of the scanning lens, and that displaces the longitudinal ends in the
5 sub-scanning direction, wherein
the adjustment unit is provided with an actuator that is driven electrically.

7. An image forming apparatus comprising:
10 an optical scanner including
a scanning lens having a curved surface centering around an optical axis;
a scanning lens holding member that holds the scanning lens; having a receiving surface that supports the curved surface; and
15 an adjustment member that rotates the scanning lens, with the optical axis as a rotating center, to adjust a position of the scanning lens.

8. The image forming apparatus according to claim 7, further
20 comprising:
a detecting unit that detects a toner mark on a belt; and
a driving unit that drives the adjustment member based on a result of the detection.

9. An image forming apparatus comprising:
an optical scanner including
a scanning lens that is disposed in a main scanning
direction as a longitudinal direction, and that transmits light from a light
5 source;
a scanning lens holding member that holds the scanning
lens so that the scanning lens is movable in a sub-scanning direction;
and
an adjustment unit including
10 two eccentric members that are disposed on both
ends of the scanning lens, and rotate centering around each of
supporting axes that are perpendicular to both the main scanning
direction and the sub-scanning direction, respectively; and
an eccentric amount adjustment unit that
15 respectively adjusts eccentric amounts of the eccentric members,
wherein
outer surfaces of each of the eccentric members make a
contact with the both ends of the scanning lens, respectively, and
both ends of the scanning lens are displaced in a
20 sub-scanning direction based on the eccentric amounts that change
with a rotation of the eccentric members.

10. The image forming apparatus according to claim 9, further
comprising:
25 a detecting unit that detects a toner mark on a belt; and

a driving unit that drives the adjustment member based on a result of the detection.

11. An optical scanner comprising:

5 an optical scanner including

a scanning lens that is disposed in a main scanning direction as a longitudinal direction, and that transmits light from a light source;

10 a scanning lens holding member that holds the scanning lens so that the scanning lens is movable in a sub-scanning direction; and

an adjustment unit that is disposed on each of longitudinal ends of the scanning lens, and that displaces the longitudinal ends in the sub-scanning direction, wherein

15 the adjustment unit is provided with an actuator that is driven electrically.

12. The image forming apparatus according to claim 11, further comprising:

20 a detecting unit that detects a toner mark on a belt; and

a driving unit that drives the adjustment member based on a result of the detection.

13. A color image forming apparatus comprising:

25 an optical scanner including

a scanning lens having a curved surface centering
around an optical axis;

a scanning lens holding member that holds the scanning
lens, having a receiving surface that supports the curved surface; and

5 an adjustment member that rotates the scanning lens,
with the optical axis as a rotating center, to adjust a position of the
scanning lens; and

N image carriers on each of which a latent image is formed,
wherein

10 the optical scanner has N optical paths so that the latent image
is formed on each of the N image carriers through the N optical paths,
and

the adjustment member is disposed on each of N-1 optical paths
among the N optical paths.

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14. A color image forming apparatus comprising:
an optical scanner including

a scanning lens that is disposed in a main scanning
direction as a longitudinal direction, and that transmits light from a light
20 source;

a scanning lens holding member that holds the scanning
lens so that the scanning lens is movable in a sub-scanning direction;
and

an adjustment unit including

25 two eccentric members that are disposed on both

ends of the scanning lens, and rotate centering around each of supporting axes that are perpendicular to both the main scanning direction and the sub-scanning direction, respectively; and

an eccentric amount adjustment unit that

- 5 respectively adjusts eccentric amounts of the eccentric members, wherein

outer surfaces of each of the eccentric members make a contact with the both ends of the scanning lens, respectively, and

both ends of the scanning lens are displaced in a

- 10 sub-scanning direction based on the eccentric amounts that change with a rotation of the eccentric members; and

N image carriers on each of which a latent image is formed,

wherein

the optical scanner has N optical paths so that the latent image

- 15 is formed on each of the N image carriers through the N optical paths, and

the adjustment member is disposed on each of N-1 optical paths among the N optical paths.

- 20 15. A color image forming apparatus comprising:

an optical scanner including

a scanning lens that is disposed in a main scanning direction as a longitudinal direction, and that transmits light from a light source;

- 25 a scanning lens holding member that holds the scanning

lens so that the scanning lens is movable in a sub-scanning direction; and

- an adjustment unit that is disposed on each of longitudinal ends of the scanning lens, and that displaces the
- 5 longitudinal ends in the sub-scanning direction, wherein the adjustment unit is provided with an actuator that is driven electrically; and

N image carriers on each of which a latent image is formed,
wherein

- the optical scanner has N optical paths so that the latent image
- 10 is formed on each of the N image carriers through the N optical paths, and
 - the adjustment member is disposed on each of N-1 optical paths among the N optical paths.

- 15 16. A color image forming apparatus comprising:
 - N optical scanners, each of the optical scanners including
 - a scanning lens having a curved surface centering around an optical axis;
 - a scanning lens holding member that holds the scanning
 - 20 lens, having a receiving surface that supports the curved surface; and
 - an adjustment member that rotates the scanning lens, with the optical axis as a rotating center, to adjust a position of the scanning lens; and
 - N image carriers on each of which a latent image is formed,
- 25 wherein

the optical scanner has a single optical path,
the latent image is formed on each of the N image carriers via
the N optical scanners, and
the adjustment member is disposed on each of N-1 optical
5 scanners.

17. A color image forming apparatus comprising:
N optical scanners, each of the optical scanners including
a scanning lens that is disposed in a main scanning
10 direction as a longitudinal direction, and that transmits light from a light
source;
a scanning lens holding member that holds the scanning
lens so that the scanning lens is movable in a sub-scanning direction;
and
15 an adjustment unit including
two eccentric members that are disposed on both
ends of the scanning lens, and rotate centering around each of
supporting axes that are perpendicular to both the main scanning
direction and the sub-scanning direction, respectively; and
20 an eccentric amount adjustment unit that
respectively adjusts eccentric amounts of the eccentric members,
wherein
outer surfaces of each of the eccentric members make a
contact with the both ends of the scanning lens, respectively, and
25 both ends of the scanning lens are displaced in a

sub-scanning direction based on the eccentric amounts that change with a rotation of the eccentric members; and

N image carriers on each of which a latent image is formed,
wherein

- 5 the optical scanner has a single optical path,
 the latent image is formed on each of the N image carriers via
 the N optical scanners, and
 the adjustment member is disposed on each of N-1 optical
 scanners.

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18. A color image forming apparatus comprising:

N optical scanners, each of the optical scanners including
 a scanning lens that is disposed in a main scanning
 direction as a longitudinal direction, and that transmits light from a light
 source;
 a scanning lens holding member that holds the scanning
 lens so that the scanning lens is movable in a sub-scanning direction;
 and

- 20 an adjustment unit that is disposed on each of
 longitudinal ends of the scanning lens, and that displaces the
 longitudinal ends in the sub-scanning direction, wherein the adjustment
 unit is provided with an actuator that is driven electrically; and
 N image carriers on each of which a latent image is formed,
 wherein

25 the optical scanner has a single optical path,

the latent image is formed on each of the N image carriers via the N optical scanners, and

the adjustment member is disposed on each of N-1 optical scanners.

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19. An image forming apparatus comprising:

an optical scanner including

a scanning lens that is disposed in a main scanning direction as a longitudinal direction, and that transmits light from a light source;

a scanning lens holding member that holds the scanning lens so that the scanning lens is movable in a sub-scanning direction; and

an adjustment unit that is disposed on each of 15 longitudinal ends of the scanning lens, and that displaces the longitudinal ends in the sub-scanning direction, wherein the adjustment unit is provided with an actuator that is driven electrically;

a plurality of sensors that is disposed in the main scanning direction with a predetermined interval to read a position of an image 20 formed on an image carrier; and

a compensating unit that compensates misalignment of the image in the sub-scanning direction by driving the actuator based on information on the position of the image read.

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20. An image forming apparatus comprising:
a plurality of optical scanning systems that employs a scanning
lens including a curved surface and having a specific adjusting axis,
wherein

- 5 the specific adjusting axis is a rotating center of the scanning
lens and center of the curved surface,
 the scanning lens is disposed on a holding member in such a
manner that the curved surface is in contact with a receiving surface of
the holding member, and
- 10 a position of the scanning lens is adjusted by a rotating
mechanism that rotates the scanning lens.